ZooKeys 39: 117–135 (2010)
doi: 10.3897/zookeys.39.424
www.pensoftonline.net/zookeys

RESEARCH ARTICLE

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# Review of the North American species of *Marimatha* Walker with descriptions of three new species (Lepidoptera, Noctuidae, Eustrotiinae) and the description of *Pseudomarimatha flava* (Noctuidae, Noctuinae, Elaphriini), a new genus and species confused with *Marimatha*

Clifford D. Ferris[1,†], J. Donald Lafontaine[2,‡]

**1** *5405 Bill Nye Ave., R.R. 3, Laramie, Wyoming 82070, USA. Research Associate: McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, Florida, USA; C. P. Gillette Museum of Arthropod Diversity, Colorado State University, Fort Collins, Colorado; Florida State Collection of Arthropods, Gainesville, Florida, USA.* **2** *Canadian National Collection of Insects, Arachnids, and Nematodes, Biodiversity Program, Agriculture and Agri-Food Canada, KW Neatby Bldg., C.E.F., Ottawa, Ontario, Canada K1A 0C6*

† *urn:lsid:zoobank.org:author:80047B1E-99C4-4227-B92B-5C430A916BEA*
‡ *urn:lsid:zoobank.org:author:2227A860-B768-4A51-8FE4-F1F3EB1CAA7F*

Corresponding authors: *Clifford D. Ferris* (cdferris@uwyo.edu), *J. Donald Lafontaine* (Don.Lafontaine@agr.gc.ca)

Academic editor: *Christian Schmidt* | Received 22 December 2009 | Accepted 20 January 2010 | Published 18 March 2010

*urn:lsid:zoobank.org:pub:66F92D10-9BCF-4B7A-AAD9-AF6042E8CEA0*

**Citation:** Ferris CD, Lafontaine JD (2010) Review of the North American species of *Marimatha* Walker with descriptions of three new species (Lepidoptera, Noctuidae, Eustrotiinae) and the description of *Pseudomarimatha flava* (Noctuidae, Noctuinae, Elaphriini), a new genus and species confused with *Marimatha*. In: Schmidt BC, Lafontaine JD (Eds) Contributions to the systematics of New World macro-moths II. ZooKeys 39: 117–135. doi: 10.3897/zookeys.39.424

## Abstract

Seven species of *Marimatha* Walker are examined, five of which occur in North America. In addition to the existing species *M. nigrofimbria* (Guenée), *M. tripuncta* (Möschler) is reported from North America for the first time and three new species are described from southwestern North America: *M. piscimala*, *M. squala*, and *M. quadrata*. *Marimatha alboflava* (Walker), *M. botyoides* (Guenée), and *M. dinumeratalis* (Walker) are discussed in terms of the generic name *Marimatha*, and *M. aurifera* (Walker) is discussed in

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relation to the identity of *M. tripuncta*. A generic diagnosis, key to species, descriptions, and illustrations of adults and genitalia are included. A new genus and species is proposed for a species currently placed as an undescribed species of *Marimatha*, but tympanal and genital characters and *mt*DNA suggest an association with the subfamily Noctuinae, tribe Elaphriini.

**Keywords**

Taxonomy, *Elaphria*, *Marimatha alboflava*, *Marimatha aurifera*, *Marimatha botyoides*, *Marimatha dinumeratalis*, *Marimatha nigrofimbria*, *Marimatha tripuncta*, *Marimatha piscimala*, *Marimatha squala*, *Marimatha quadrata*, *Thioptera*, *Pseudomarimatha flava*, *Xanthoptera*, Arizona, Brazil, Florida, Honduras, Mexico, New Mexico, Puerto Rico, Texas

## Introduction

The species discussed herein were originally placed in *Xanthoptera* Guenée 1852, which is a junior homonym of *Xanthoptera* Sodoffsky, 1837. Franclemont (1950) proposed the objective replacement name *Thioptera*. Berio (1966) proposed the objective replacement name *Flavula*, apparently unaware of Franclemont's replacement name. Based upon examination of the genitalia of *Marimatha dinumeratalis* Walker, [1866] (TL: Honduras), it is evident to us that *Thioptera* should become a junior synonym of *Marimatha* Walker, [1866]. The type species of *Marimatha* is *M. dinumeratalis* Walker, [1866] (TL: Honduras) by subsequent designation by Hampson (1894: 324). *Marimatha dinumeratalis* and *M. alboflava* (Walker, 1862) (TL: Honduras) are junior subjective synonyms of *M. botyoides* (Guenée, 1852) (Fig. 17) (Nye 1975; Poole 1989). Although there are several undescribed species related to *M. botyoides* in Central America, the reddish-brown shading in the subterminal area and distinct black terminal line are diagnostic for the type specimens of the three names referable to *M. botyoides*. *Marimatha aurifera* (Walker, [1858]) [TL: Brazil] has been listed erroneously in the literature as occurring in the Caribbean and in North America in Florida and Texas. Adults of *M. aurifera* lack the frontal protuberance that occurs in four of the five North American species. Examination of the genitalia separates *M. aurifera* (Fig. 16) from *M. nigrofimbria* (Guenée) (Fig. 11), the only North American species that also lacks a frontal protuberance.

A small noctuid from Arizona has been generally assumed to be another undescribed species of *Marimatha* because of similar size and build, lemon-yellow forewing with a dark fringe. However, the genital characters and DNA associate it with the subfamily Noctuinae: tribe Elaphriini rather than with *Marimatha* in the Eustrotiinae. It is described after the revision of *Marimatha*.

## Materials and methods

**Repository abbreviations**

**Specimens were examined from the following collections:**

**AMNH** American Museum of Natural History, New York, NY, USA.

**BMNH** The Natural History Museum [statutorialy: British Museum (Natural History)], London, UK.

**CMNH** Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, USA

**CNC** Canadian National Collection of Insects, Arachnids, and Nematodes, Ottawa, Ontario, Canada.

**CDF** Personal Collection of Clifford D. Ferris, Laramie, Wyoming, USA.

**CUIC** Cornell University Insect Collection, Ithaca, New York, USA.

**FSCA** Florida State Collection of Arthropods, McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, Florida, USA.

**JBW** Personal collection of J. Bruce Walsh, Tucson, Arizona, USA.

**OUMNH** Oxford University Museum of Natural History, Oxford, UK.

**TLSC** Texas Lepidoptera Survey Collection, Houston, Texas, USA.

**TSD** Personal Collection of Terhune S. Dickel, Anthony, Florida, USA.

**USNM** National Museum of Natural History [formerly, United States National Museum], Washington, District of Columbia, USA.

**ZMHB** Museum für Naturkunde der Humboldt-Universität, Berlin, Germany.

**Dissecting methods and genital terminology.** Dissection of genitalia and terms for genital structures and wing markings follow Lafontaine (2004).

**Description abbreviations**

**DFW** Dorsal forewing.

**DHW** Dorsal hindwing.

**TL** Type locality.

**VFW** Ventral forewing.

**VHW** Ventral hindwing.

### *Marimatha* Walker, [1866]

Type species: *Marimatha dinumeratalis* Walker, [1866].

**Note.** *Marimatha dinumeratalis* is a junior subjective synonym of *M. botyoides* (Guenée, 1852) as is *Marimatha alboflava* (Walker, 1862). All three type specimens were examined. The types were not dissected (that of *M. dinumeratalis* lacks an abdomen), but specimens comparable with the types in appearance and locality were.

*Xanthoptera* Guenée, 1852, **syn. n.**
Type species: *Xanthoptera nigrofimbria* Guenée, 1852.
Preoccupied by *Xanthoptera* Sodoffsky, 1837.

*Thioptera* Franclemont, 1950, **syn. n.**
Type species: *Xanthoptera nigrofimbria* Guenée, 1852.
Objective replacement name for *Xanthoptera* Guenée, 1852

*Flavula* Berio, 1966, **syn. n.**
Type species: *Xanthoptera nigrofimbria* Guenée, 1852.
Unnecessary replacement name for *Xanthoptera* Guenée, 1852

**Diagnosis. Adults.** Males and females of similar size (FWL: 8.5–11 mm), similar in range for all species. *Head* – male antenna almost filiform, but very slightly swollen between segments, ventrally minutely setose; female antenna filiform, ventrally minutely setose; head yellow with brown spot in front of eye; palpus upturned, outer surface brown speckled with yellow, inner surface yellowish speckled with brown, terminal segment yellow tipped; frons brown, rounded in some species (only *M. nigrofimbria* in North America), or bulging into transverse ridge with flat tubercle-like surface on lower side of ridge (four species in North America). *Thorax* – bright yellow. *Wings*: DFW with lustrous or glossy aspect, usually bright yellow with dark blackish brown shading on wing margin and fringe and on three dark-brown spots, one at position of reniform and two at position of antemedial line (a small one below costa and a larger one below cubital vein), and usually with some dark shading on postmedial line; DHW pale fuscous to dark fuscous, usually darker on veins and toward wing margin. *Male genitalia* – tegumen triangular when viewed laterally, wider dorsally and tapered to point at junction with vinculum; uncus cylindrical, 1/3–1/2 × length of valva, blunt at apex or with short sclerotized hook; saccus elongate, tapered anteriorly, 1/3–2/3 × length of valva; valva somewhat triangular, broad at base and narrow toward blunt or spine-tipped apex; valva with large, dorsally rounded sacculus, right sacculus larger than left one in some species; clasper a thickened area on ventral margin of valva distal to sacculus, with triangular ampulla-like process near base of clasper in most species; pollex a costal process 1/4–1/3 distance from apex; aedeagus 1–2 × length of valva, usually ending in blunt spine at apex ventrally; vesica tubular or slightly inflated, basal part more rigid in some species because of longitudinal sclerotized ridges, apical part membranous with one to several clusters of heavily sclerotized cornuti in most species. *Female genitalia* – corpus bursae without signa, irregularly oval and tapered posteriorly in most species; ductus seminalis on left side of corpus bursae, toward posterior end in most species but anterior to middle in *M. tripuncta* group; ductus bursae long and sinuate, lightly to heavily and irregularly sclerotized; ostium bursae heavily sclerotized with ventral plate projecting posteriorly over opening of ostium in most species; abdominal segment eight (A8) short and weakly sclerotized, especially dorsally; anterior apophyses thin, moderately sclerotized, about as long as A8 and 1/2 as long as posterior apophyses; anal papillae lightly sclerotized and setose, quadrangular in lateral profile.

**Key to North American species of *Marimatha***

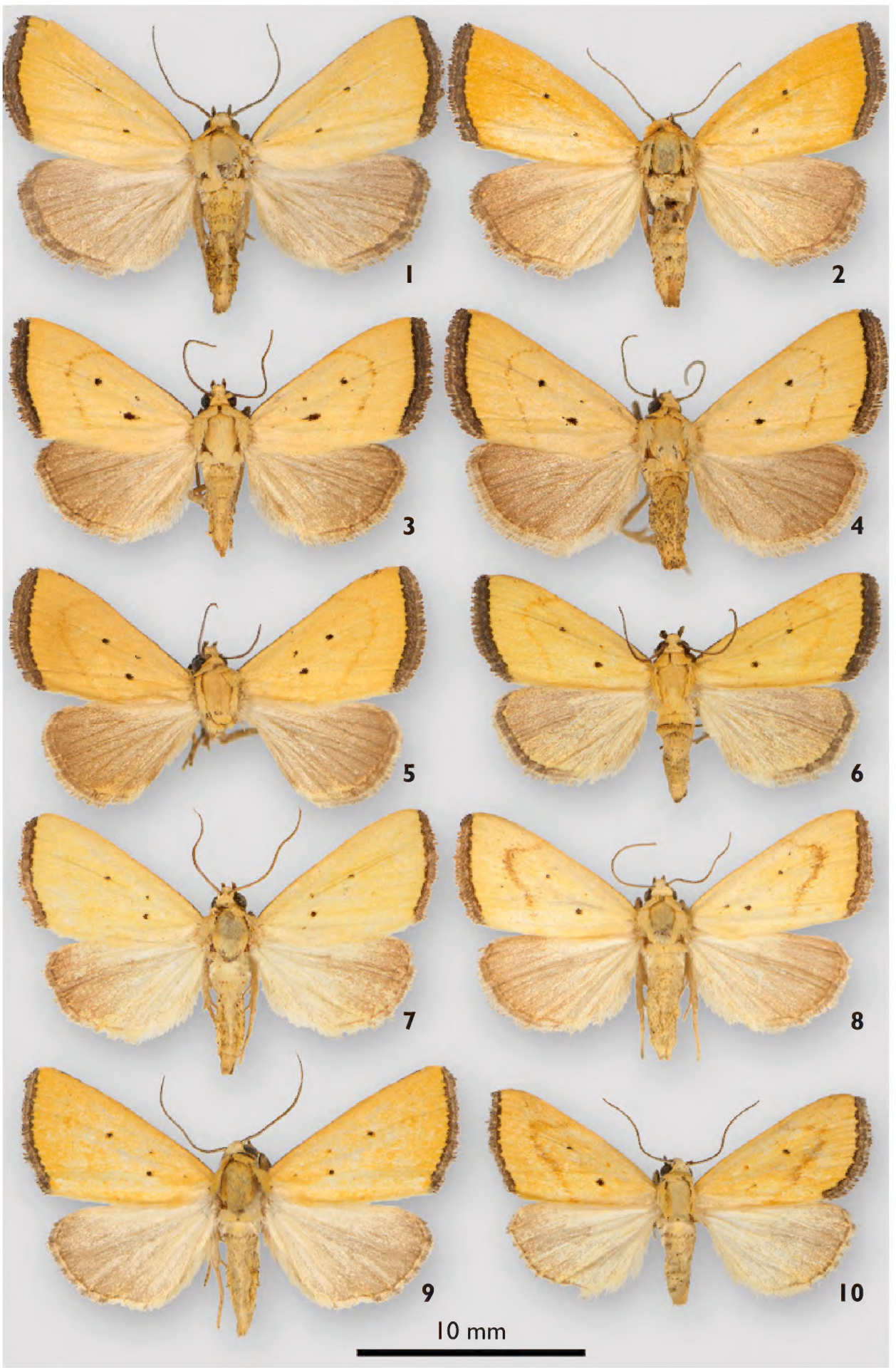
1. Head without frontal protuberance; forewing usually with no trace of postmedial line; eastern United States..... ***M. nigrofimbria***
– Head with frontal protuberance with raised transverse ridge; postmedial line usually indicated by dark scales; southern Florida and southern Texas westward to Arizona and southward to Costa Rica..... **2**
2. Male genitalia ..... **3**
– Female genitalia ..... **6**
3. Prominent single projection arising about mid-length from dorsal margin of valva; postmedial line evenly curved around position of reniform spot..... **4**
– Multiple narrow dentate projections along dorsal margin of valva; postmedial line deeply curved around position of reniform spot ..... **5**
4. Projection truncated apically to form squarish process .....***M. quadrata***
– Projection sharply pointed and triangular ..... ***M. squala***
5. Preapical diverticulum in vesica with several large cornuti with basal tooth; Carribean and southern Florida .....***M. tripuncta***
– Preapical diverticulum in vesica with several smaller tapered cornuti; Texas and Arizona to Costa Rica..... ***M. piscimala***
6. Ostial plate minute, slightly concave mesially; ductus bursae with 360 degree loop .....***M. quadrata***
– Ostial plate prominent, cleft mesially; ductus bursae slightly sinuate..... 7
7. Ostial plate wedge-shaped with concave sides and small u-shaped notch; ductus seminalis near posterior end of corpus bursae ..... ***M. squala***
– Ostial plate heart-shaped and deeply incised; ductus seminalis anterior to middle of corpus bursae ..... **8**
8. Corpus bursae with shallow, angled diverticulum posteriorly on right; Carribean and southern Florida .....***M. tripuncta***
– Corpus bursae evenly tapered posteriorly; Texas and Arizona to Costa Rica ..... ***M. piscimala***

## Descriptions

***Marimatha nigrofimbria* (Guenée 1852), comb. n.**
Figs 1, 2, 11, 18

*Xanthoptera nigrofimbria* Guenée *in* Boisduval and Guenée, 1852: 241, pl. 10, Fig. 12.
*Thioptera nigrofimbria* (Franclemont, 1950).

**Type material.** North America: lost. **Neotype**: Florida. USNM, here designated. There are two superficially similar species in eastern North America, so to ensure the stability of the name we designated a male labeled "USA, Florida, Marion Co., W Anthony




**Figures 1–10.** *Marimatha* adults. **1** *M. nigrofimbria* ♂, 1.4 mi WSW Anthony, Marion Co., Florida **2** *M. nigrofimbria* ♀, Big Cypress Natute Preserve, Collier Co., Florida **3** *M. squala* ♂, Madera Canyon 4880', Santa Rita Mts., Santa Cruz Co., Arizona **4** *M. squala* ♀, Madera Canyon 4880', Santa Rita Mts., Santa Cruz Co., Arizona **5** *M. quadrata* ♂, Madera Canyon 3800', Santa Rita Mts., Pima Co., Arizona **6** *M. quadrata* ♀, Concan, Uvalde Co., Texas **7** *M. tripuncta* ♂, Fuchs Hammock near Homestead, Dade Co., Florida **8** *M. tripuncta* ♀, Fuchs Hammock near Homestead, Dade Co., Florida **9** *M. piscimala* ♂, Brown Canyon, Baboquivari Mts., Pima Co., Arizona **10** *M. piscimala* ♀, Mission, Hidalgo Co., Texas.

Rd, 1.4 mi W Anthony, 29°17'N, 82°08'W, 4 May 2000, T. S. Dickel" as neotype for *Xanthoptera nigrofimbria* Guenée, 1852.

**Other material examined and distribution.** Approximately 2,400 specimens examined from the following states: Alabama, Arkansas, District of Columbia, Florida, Georgia, Illinois, Indiana, Kentucky, Louisiana, Massachusetts, Mississippi, Missouri, New Jersey, North Carolina, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, Virginia.

**Diagnosis.** Head with rounded frons. Male genitalia: valva with sharp apical point, irregular dorsal margin with large, tapered process at about 1/3 from apex; aedeagus with three clusters of cornuti, one toward base, one near apex, and a tight bundle of cornuti at apex. Female genitalia: ostial plate of female genitalia lyre-shaped with even slightly concave margin.

**Description. Adult:** *Head* – Front rounded without protuberance. **Thorax** – Yellow with brown flecks. *Legs*: Foreleg and middle leg, brown flecked with paler scales; hindleg yellow-tan flecked with brown scales. *Wings*: DFW lemon yellow with dark discal dot and usually a second dark spot in fold at 1/4 from wing base; occasionally a third spot below costa at ¼ from base; some pale orange shading may be present toward outer margin and on costa; terminal line and fringe blackish brown; DHW yellowish white with fuscous scaling toward wing margin and on terminal line; VFW yellowish buff, heavily infuscated with dark scales, except on well-defined pale band on inner margin; VHW pale buff, heavily flecked with brown scales, especially along anterior margin of wing. Female similar to male, but wings usually darker, especially hindwing. *Male genitalia* – *Uncus*: decurved, slender, expanded toward apex with acute tip. *Valvae*: symmetrical, basally broad, tapering to mid-length (at apex of sacculus), then narrowing to a pointed apex, without corona; dorsal margin irregular with triangular process at approximately 1/3 from apex; sacculus with blunt apex and uneven dorsal margin. *Aedeagus*: smoothly sclerotized; everted vesica tubular with a short stout spine at base, then patch of 5 robust spines near base, a distal patch of 6 large robust spines adjacent to a smaller patch of approximately 6 smaller spines of varying length. *Female genitalia* – Corpus bursae oval, tapered posteriorly with ductus seminalis at posterior end and ductus bursae entering corpus bursae on right near posterior end. Ductus bursae sinuate, with sclerotized longitudinal ridges, posterior ⅓ narrower than anterior ⅔ and gradually widening toward corpus bursae. Ostium bursae heavily sclerotized, lyre shaped, with sides constricted toward posterior end and with short ostial plate with slightly concave posterior margin.

**Distribution and biology.** Massachusetts westward through northern Ohio to Illinois and Oklahoma and southward to southern Florida and southernmost Texas. Flight season is from May to September in the northern part of the range and from March to November in the South. Reported larval hosts are *Digitaria ischaemum* (Schreb.) Shreb. ex Muhl. (Poaceae), and *Ipomoea sagittata* Poir. (Convolvulaceae).

**Remarks.** *Marimatha nigrofimbria* is replaced by a closely related undescribed species that occurs from southern Mexico (Chiapas) southward to Colombia. It will be treated in a revision of the genus *Marimatha* in Central America in preparation by J. B. Sullivan.

***Marimatha squala*** **Ferris & Lafontaine, sp. n.**
urn:lsid:zoobank.org:act:9D012295-1CCF-4AE8-8943-283CFC9DC278
Figs 3, 4, 12, 19

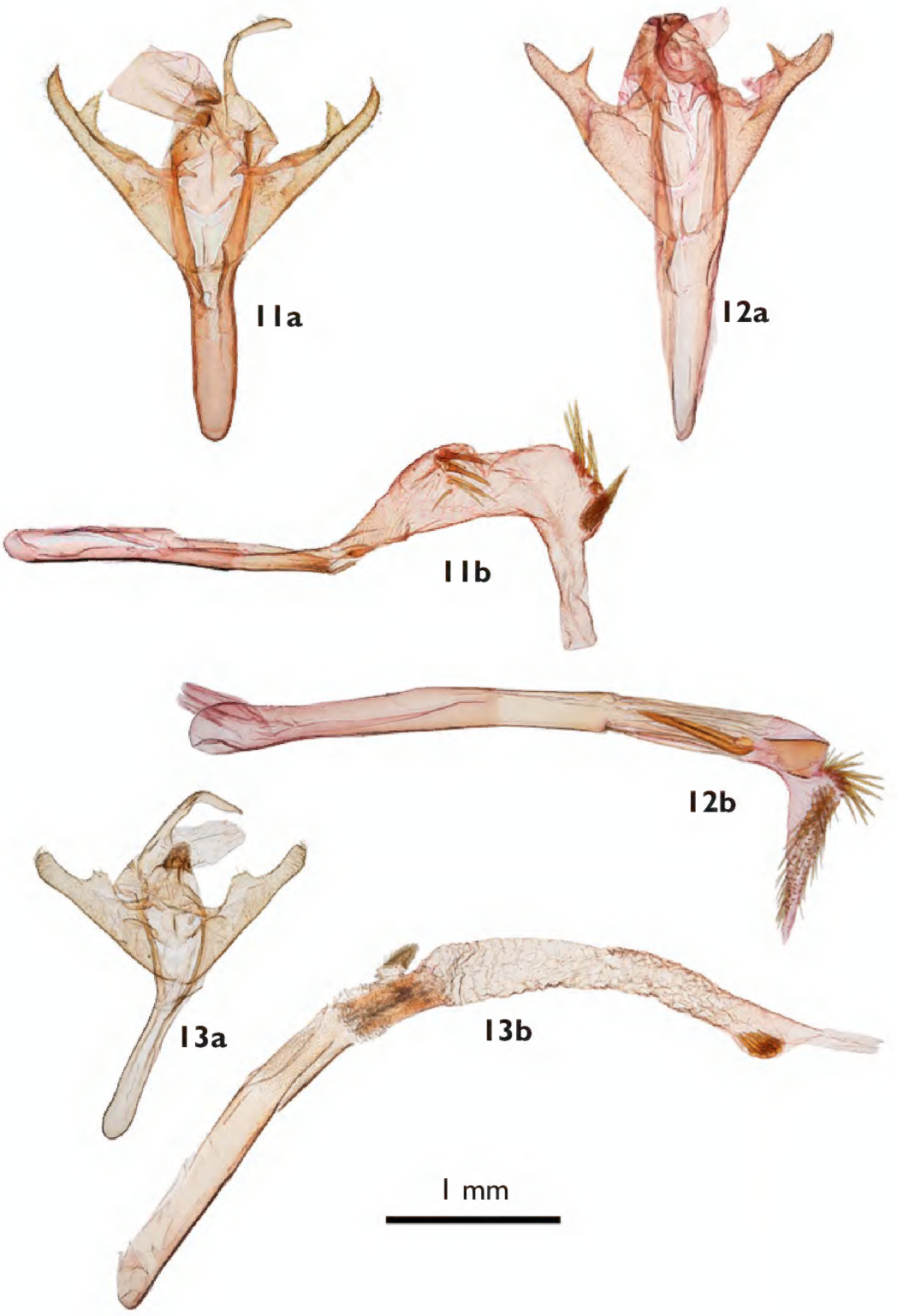
**Type material. Holotype** ♂: **Arizona**, Cochise Co., Peloncillo Mts., Guadalupe Cyn., 30 July 1989, B. & J.F. Landry; Genitalia CNC slide # 14892 m. CNC. Paratypes 29 ♂, 23 ♀: **Arizona**. Santa Cruz Co., Madera Canyon 4880', 10 July – 28 Aug. 1959 (16 ♂, 11 ♀), 24 June – 20 July 1960 (4 ♂, 1 ♀), J. G. Franclemont; Santa Cruz Co., Peña Blanca 3950', 14 July 1960 (7 ♂), 2–5 Aug. 1960 (1 ♂, 2 ♀), J. G. Franclemont; Santa Cruz Co., Atascosa Mts., Peña Blanca Canyon 3900', 31°38'N, 111°09'W, 3 Aug. 2008, C. Schmidt & B. Walsh (3 ♀); Santa Cruz Co., Oro Blanca Mts., Peña Blanca Lake 3700', 10 mi WNW Nogales, 25 July 1971, L. M. Martin (1 ♂, 1 ♀). **Mexico.** Guerrero, 33 mi S Iguala, 1450', 5 Aug. 1954, J. G. Chillcott (5 ♀). Paratypes deposited in CDF, CNC, CUIC, JBW, and USNM.

**Other material examined and distribution. USA. Arizona**. Cochise Co. Carr Canyon, Huachuca Mts, 31°26.38'N 110°15.87'W, 5600', 6 August 2009, C. D. Ferris; Cochise Co., Brushy Canyon, Chiricahua Mts, 31°44.19'N 109°14.16'W, 5470', 31 July 2009, C. D. Ferris; Cochise Co., Banning Creek, Mule Mts, 31°27.78'N 109°52.22'W, 5700', 2 August 2009, C. D. Ferris. Santa Cruz Co., Peña Blanca, 5 July 2009, Nate Gibson; Santa Cruz Co., Patagonia (in town), 31°32.62' N 110°45.31' W, 4050', 7–8 August 2009, C. D. Ferris. **Costa Rica**. **Guanacaste**, Area de Conservacion Guanacaste, Sector Santa Elena, La Angostura, 25 May 2006, F. Quesada & R. Franco.

**Etymology.** The species name is derived from the shark genus *Squalus* in reference to the sharkfin-like process on the dorsal margin of the male valva.

**Diagnosis.** Head with frontal protuberance. Male genitalia: dorsal margin of valva smooth with sharply pointed triangular process at about 1/4 from apex; vesica with single large subbasal cornutus and a spine-covered diverticulum near apex. Female genitalia: ostial plate protruding, wedge shaped with convex sides, posterior margin cleft in middle 1/3 to base.

**Description. Adult:** *Head* – Frontal protuberance crater-like, nearly circular, flattened above haustellum. *Thorax* – Yellow with brown flecks. *Legs*: yellow, flecked with brown scales, more heavily on forelegs and middle legs, and in females. *Wings* (both sexes): DFW lemon yellow with dark discal spot and additional dark spot in fold at 1/4 from wing base; usually a smaller third spot below costa at 1/4 from base; a thin orange-brown postmedial line evenly curving around discal spot in most specimens. DHW fuscous. VFW yellowish buff, heavily infused with brown scales with well-defined pale band along inner margin. VHW yellowish, moderately flecked with brown scales, indistinct brown marginal line; in some specimens a suggestion of a brown discal spot and postmedian line. *Male genitalia* – *Uncus*: decurved, slender, expanded slightly apically with blunt rounded tip. *Valvae*: symmetrical, basally broad tapering to approximately middle (at apex of sacculus), then narrowing to a rounded apex, without corona; dorsal margin with prominent, sharply-pointed, triangular process at about 1/4 from apex; sacculus broad with slightly pointed rounded apex and with




**Figures 11–13.** *Marimatha* male genitalia. **11** *M. nigrofimbria* **12** *M. squala* **13** *M. quadrata*.

small spines sparsely distributed along dorsal margin. *Aedeagus*: smoothly sclerotized; vesica with single large dorsal cornutus projecting anteriorly, a flat sclerotized plate by opening into ductus ejaculatorius, and with long, tapered, spine-covered diverticulum to left of ductus ejaculatorius. *Female genitalia* – Corpus bursae ovoid without surface features, tapered posteriorly; ductus seminalis arising on left near junction with ductus bursae. Anterior 1/2 of ductus bursae lightly sclerotized, narrow at opening to corpus bursae, then expanded to sclerotized posterior part; a thumb-like diverticulum on ductus bursae on right just posterior to constriction at corpus bursae; posterior 1/2 of ductus bursae well sclerotized with a pleated-like (corrugated) section. Ostial plate an elongate wedge with concave sides, convex posterior margin cleft in middle 1/3 to base.

**Distribution and biology.** Arizona and southward to Costa Rica. Flight season is from mid-July to mid-August in Arizona and from late May in Costa Rica.

***Marimatha quadrata* Ferris & Lafontaine, sp. n.**
urn:lsid:zoobank.org:act:E2CD3094-DB83-4006-8B25-0C13E570B94F
Figs 5, 6, 13, 20

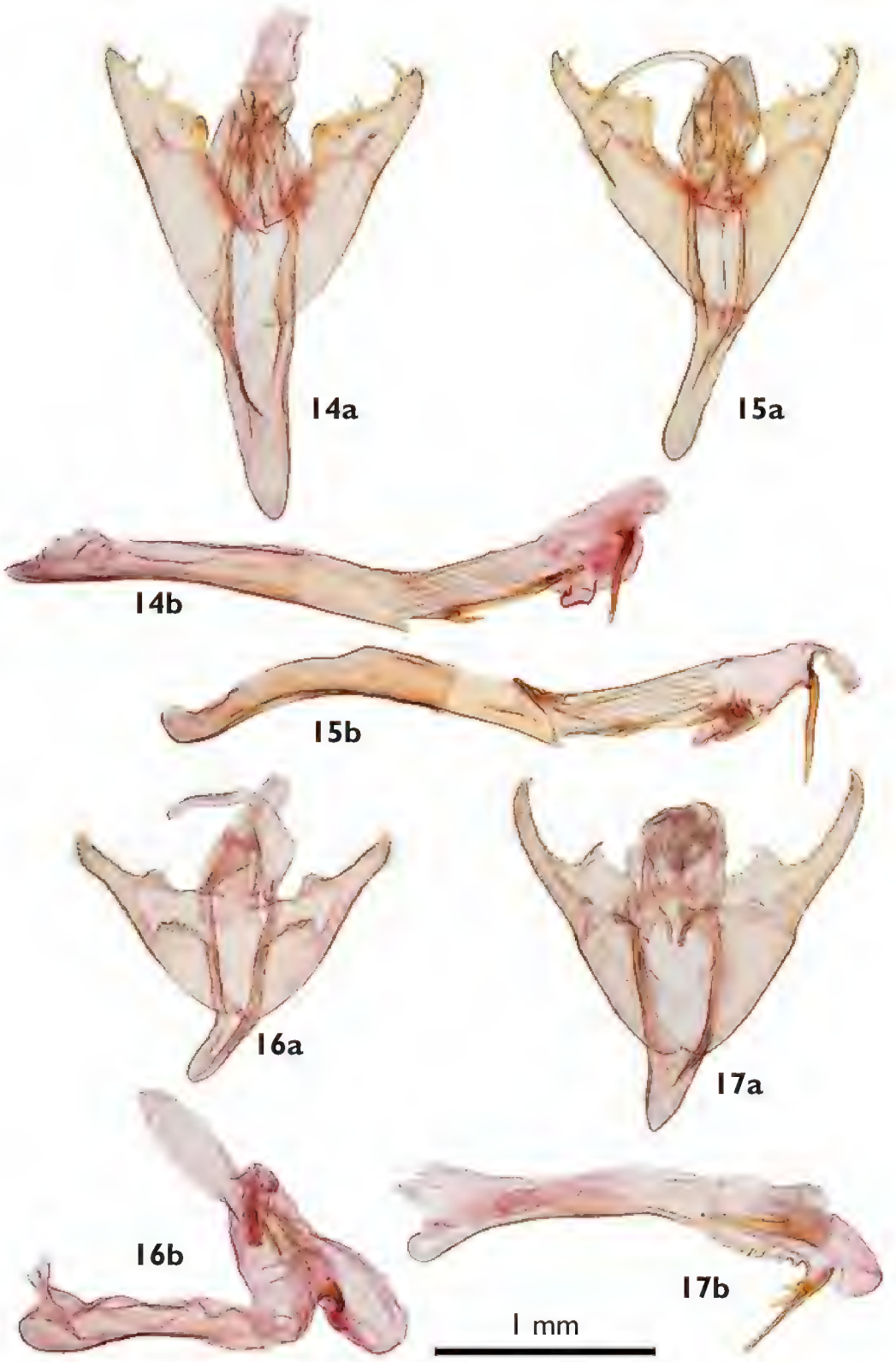
**Type material Holotype** ♂. Texas, Reeves Co., Texas, 18 May 1950, E. C. Johnson; Genitalia CNC slide # 14263 m. CNC. Paratypes 5 ♂, 4 ♀: **Arizona:** Santa Cruz Co., Madera Canyon 4880', 9 – 28 Aug. 1959, J. G. Franclemont (1 ♂, 2 ♀); Santa Cruz Co., Atascosa Mts., Peña Blanca Canyon 3900', 31°38'N, 111°09'W, 3 Aug. 2008, C. Schmidt & B. Walsh (1 ♀). **Texas:** Brewster Co., Big Bend Nat. Pk., Chisos Basin, 8–10 Sept. 2008, Bordelon/Knudson (2 ♂); Terrell Co., Sanderson, 5, 14 Sept. 2008, Bordelon/Knudson (1 ♂); Uvalde Co., Concan, 3, 16 Sept.2008, Bordelon/Knudson (1 ♂). **Mexico:** Sinaloa, 5 mi N Mazatlan, 30 July 1964 (1 ♂), 5–7 Aug. 1964, J. E. H. Martin (1 ♀). Paratypes deposited in CNC, CUIC, and TLSC.

**Other material examined and distribution. USA. Arizona.** Pima Co., Rincon Mts, 32°02.24'N 110°39.90'W, 3370', 13 August 2009, C. D. Ferris; Santa Cruz Co., Patagonia (in town), 31°32.62'N 110°45.31'W, 4050', 7 August 2009, C. D. Ferris.

**Etymology.** The species name is derived from *quadratus* (four-cornered) in reference to the quadrangular process on the dorsal margin of the male valva.

**Diagnosis.** Head with nearly circular crater-like frontal protuberance. Male genitalia: dorsal margin of valva with large squared-off projection near mid-length. Female genitalia: with slightly protruding ostial plate with concave posterior margin; posterior sclerotized part of ductus bursae curved in a 360° loop.

**Description. Adult:** *Head* – Frontal protuberance crater-like, nearly circular, with well defined rim and deep central depression. *Thorax* – Yellow with brown flecks. *Legs*: Forelegs and middle legs brown flecked with paler scales; hindlegs yellow flecked with brown scales. *Wings* (both sexes): DFW lemon yellow with dark discal spot and additional dark spot in fold at 1/4 from wing base; usually a smaller third spot below costa at 1/4 from base; a thin orange-brown postmedial line evenly curving around discal spot in most specimens. DHW pale yellow. VFW yellow, moderately infused with brown scales with pale band along inner margin. VHW yellow, moderately flecked with brown scales, indistinct brown marginal line; in some specimens a suggestion of a brown discal spot and postmedial line. *Male genitalia* – *Uncus*: decurved, slender, spatulate tip. *Valvae*: symmetrical, basally broad, tapering to approximately middle (at apex of sacculus), then narrowing to rounded apex, without corona; ventral margin even, dorsal margin with large squared-off process near middle; sacculus broad with rounded apex. *Aedeagus*: everted vesica an extremely long tube (length of aedeagus and everted vesica about 5 mm) with a small spinulose conical sac at base and 6 robust spines on small diverticulum at distal end. *Female genitalia* – Corpus bursae heart-shaped, tapered to blunt point




**Figures 14–17.** *Marimatha* male genitalia. **14** *M. tripuncta* **15** *M. piscimala* **16** *M. aurifera* **17** *M. botyoides*.

at anterior end; ductus seminalis arising on left near junction with ductus bursae. Ductus bursae arising from posterior end of right lobe of corpus bursae; long and evenly curved through anterior 1/2, with longitudinal sclerotized ridges; posterior 1/2 of ductus narrowed and forming a 360° loop. Ostium bursae a semicircular lightly sclerotized sac with slightly protruding ostial plate with concave posterior margin.

**Distribution and biology.** Western Texas and Arizona and southward to southern Mexico (Sinaloa). Flight season is from mid-May to mid-September.

***Marimatha tripuncta* (Möschler, 1890), comb. n.**
Figs 7, 8, 14, 21

*Xanthoptera tripuncta* Möschler, 1890:158
*Thioptera aurifera* of authors, not (Walker, [1858])

**Type material.** Three female syntypes. Puerto Rico. MNHU, Berlin, examined.

**Other material examined.** Southern Florida; Cuba; Dominican Republic; Haiti; Puerto Rico; St Croix, Virgin Islands; Trinidad.

**Diagnosis.** Separated from other species in its North American range by the tuberculate frons, the dark transverse smudge on the DFW, and the deeply curved postmedial line. Some specimens of *piscimala* from Texas are superficially similar. Male genitalia with large apical cornutus with basal process and several smaller cornuti. Female genitalia with angled diverticulum posteriorly on right side of corpus bursae.

**Description.** Not distinguishable from *Marimatha piscimala* except by distribution, DNA, and the genital characters given in the diagnosis.

**Distribution and Biology.** Caribbean and southern Florida. Flight season late April to mid-October.

**Remarks.** This species was tentatively identified in Florida as *Thioptera* [=*Marimatha*] *aurifera* (Walker, 1862) by Kimball (1965) and was listed as *T. aurifera* by Franclemont and Todd (1983) and Heppner (2003). *Marimatha aurifera* is a South American species that lacks a frontal tubercle and has very different genitalia (Fig. 16).

***Marimatha piscimala* Ferris & Lafontaine, sp. n.**
urn:lsid:zoobank.org:act:F610BE0F-C8CF-4BA7-9C3D-BB88F91EB1DF
Figs 9, 10, 15, 22

**Type material. Holotype** ♂. **Texas.**, Kimble Co., Fred Coleman Ranch, 12 mi S Junction, 16 June 1972, B. Wright; Genitalia CNC slide # 15033 m. CNC. **Paratypes:** 22 ♂, 17 ♀. **USA. Arizona.** Cochise Co., Ash Canyon, Huachuca Mts., 5170', 20 July 2006 (1 ♀), 4 Aug. 2009 (1 ♀), C. D. Ferris; Pima Co., Baboquivari Mts., Brown Canyon, 3880', 18–19 Aug. 2006, C. D. Ferris (6 ♂, 3 ♀); Pima Co., Baboquivari Mts., Brown (Bear) Canyon, 5300–5900', 2 Aug. 2008, C. Schmidt & L. Crabo, mesquite/riparian (1 ♂); Santa Cruz Co., Madera Canyon 4880', 13 July – 28 Aug. 1959, J. G. Franclemont (3 ♂, 3 ♀); Santa Cruz Co., Peña Blanca 3950', 7 Aug. 1959 (1 ♂), 23 Aug. 1960 (1 ♂), J. G. Franclemont; Santa Cruz Co., Patagonia, 4050', 8 Aug. 2009, C. D. Ferris (1 ♂). **Texas.** Cameron Co., Audubon Sabal Palm Grove, 11 Oct. 1996, C. Bordelon (1 ♀), 20 April 1997 E. C. Knudson (1 ♀); Comal-Hayes Counties, El Rancho, 29 Aug. 1975, A. & M. E. Blanchard (1 ♂); Hidalgo Co., Bentsen State Park, 18–19 April 1997, E. C. Knudson (1 ♀); Hidalgo Co., Mission, 12 Oct. 2008, C. W. Bordelon (1 ♂); Jeff Davis Co., Ft Davis, Jeff Mts. State Park, 11–13 Sept. 2008, Knudson/Bordelon (1 ♂, 1 ♀); Kerr Co., Kerrville State Park, 19 Aug.

**Figures 18–22.** *Marimatha* female genitalia. **18** *M. nigrofimbria* **19** *M. squala* **20** *M. quadrata* **21** *M. tripuncta* **22** *M. piscimala.*

1980, E. C. Knudson (1 ♀); Starr Co., Roma, 6,7 Oct. 1996, E. C. Knudson (1 ♀). **Mexico. Chiapas:** 5 mi NW Pijijiapan, Hwy. 200, 31 May 1969, A. Mutuura (5 ♂, 1 ♀); Chiapas, 15 May, R. Muller (1 ♀); **San Luis Potosi**, El Naranjo, El Salto, 29 June 1965, P. Spangler (1 ♀). **Panama.** La Chorrera, 12 May, August Busck (1 ♂). Paratypes deposited in CDF, CNC, CUIC, JBW, TLSC, and USNM.

**Other material examined. USA. Arizona.** Cochise Co., Ash Canyon, Huachuca Mts, 31°23.17'N 110°14.281'W, 5170', 4 August 2009, C. D. Ferris. Santa Cruz Co., Patagonia (in town), 31°32.62'N 110°45.31'W, 4050', 8 August 2009, C. D. Ferris. **Costa Rica.** Guanacaste, Area de Conservacion Guanacaste, Sector Santa Elena, La Angostura, 26 May 2006 (1 ♀), 24 July 2006 (1 ♂), F. Quesada & R. Franco.

**Etymology.** The species name is derived from the Latin for fish (*Piscis*) and jaw (*mala*) and refers to the fish-jaw like appearance of the male valva.

**Diagnosis.** Head with frontal protuberance. Male genitalia: valva broad, ventral margin even; dorsal margin slightly concave to middle, then tapering to apex with multiple narrow dentate projections from dorsal margin; vesica with a long apical cornutus and postmedial cluster of cornuti with mixture of two large and many small cornuti. Female genitalia: ostial plate heart shaped with cleft in middle of posterior margin extending almost to base of plate.

**Description. Adult:** *Head* – Frontal protuberance shallow crater-like prolate ellipsoidal. *Thorax* – Yellow with brown flecks. *Legs*: yellow, flecked with brown scales, more heavily on forelegs and middle legs, and in females. *Wings* (both sexes): DFW golden yellow with dark discal spot and additional dark spot in fold at ¼ from wing base; often with a smaller third spot below costa at 1/4 from base; a thin orange-brown postmedial line deeply curving around discal spot in some males and most females; specimens from southeastern Texas, and less commonly those from elsewhere, may have increased dark shading on the postmedial line and sometimes a longitudinal streak along the middle of the wing like that often present in *M. tripuncta*. DHW pale fuscous. VFW yellow, heavily infused with brown scales with well-defined pale band along inner margin. VHW yellow, moderately flecked with brown scales, indistinct brown marginal line; in some specimens a suggestion of a brown discal spot and postmedial line. *Male genitalia* – *Uncus*: decurved, slender, slightly spatulate tip. *Valvae*: symmetrical, broad basally, ventral margin even; dorsal margin slightly concave to middle, then tapering sharply to apex with multiple (7 typically) narrow dentate projections from dorsal edge; apex pointed, corona absent. *Aedeagus*: smoothly sclerotized; vesica with one large apical cornutus and postmedial cluster of smaller cornuti. *Female genitalia* – Corpus bursae elongate without surface features; ductus seminalis on right side about ⅓ from anterior end. Anterior part of ductus bursae broad and lightly sclerotized, ductus constricted and elbowed at 1/3 from anterior end with posterior 2/3 narrower and increasingly heavily sclerotized. Ostial plate heart shaped with cleft in middle of posterior margin extending almost to base of plate; when apex of plate brushed in undissected specimens protruding sides of plate project posterolaterally.

**Distribution and biology.** Southeastern Texas to Arizona southward to Panama. Flight season mid-April to mid-October, probably several generations.

## *Pseudomarimatha* Ferris & Lafontaine, gen. n.

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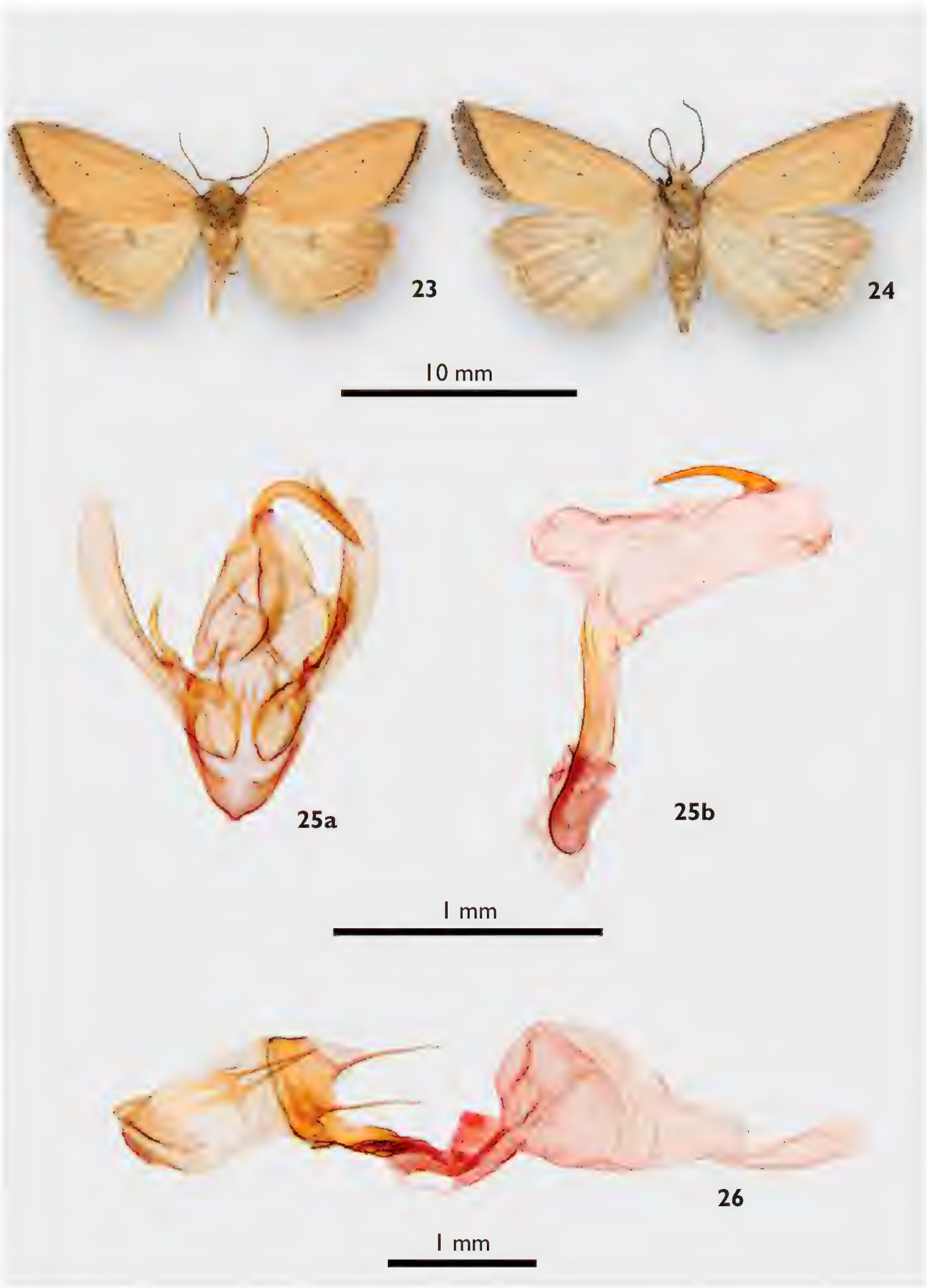
**Type species.** *Pseudomarimatha flava* Ferris & Lafontaine, sp. n.

**Etymology.** The generic name *Pseudomarimatha* is taken from the Latin *Pseudo* (false) and *Marimatha* (the noctuid genus with which *Pseudomarimatha* has been confused and is likely to continue to be confused.

**Diagnosis.** Head with rounded slightly bulging frons; hindwing with vein $M_2$ reduced to fold near middle of cell, veins $M_2$ and $CuA_1$ on common stalk; tympanic membrane with central sclerite raised and nodular. Male genitalia: tegumen broad, en-




**Figures 23–26.** *Pseudomarimatha flava* adults and genitalia. **23** ♂, Portal, Cochise Co, Arizona **24** ♀, Onion Saddle, Chiricahua Mts, Cochise Co., Arizona **25** male genitalia **26** female genitalia.

larged into posterior lobe ventrally; valva with triangular sacculus with apex separated from remainder of sacculus by membranous band; valva narrow at apex of sacculus, gradually widening to broadly rounded apex, without corona; clasper on costal margin of valva, about 1/4 × valva length; vesica slightly longer than aedeagus with subbasal

diverticulum and large apical cornutus 3/4 × as long as aedeagus. Female genitalia: corpus bursae globular posterior, abruptly tapered anteriorly; posterior 1/3 of ductus bursae heavily sclerotized; apophyses long and narrow with triangular plate in posterior apophysis near middle; anal papillae sclerotized.

*Pseudomarimatha* appears to be most closely related to *Elaphria* Hübner, but differs in that the costa of the male valva is continuously sclerotized almost to the apex of the valva; the clasper is a simple tapered sinuate structure arising from a swollen base; the isolated apical part of the sacculus is lightly sclerotized, like the rest of the sacculus. In *Elaphria* there is a gap in the sclerotization of the costal margin of the valva near the end of the clasper, so in dissection the valva tends to fold back on itself at this point; the base of the clasper is forked with a ventrally directed process; and the isolated apical part of the sacculus is much more heavily sclerotized than the basal part.

**Description. Adult:** *Head* – Frons rounded, slightly bulging; labial palpus curving upward with third segment slightly porrect, middle segment 3 × as long as basal and apical segments; male antenna filiform, densely setose ventrally, female similar but sparsely setose ventrally; eye rounded; ocellus present; vestiture of head and palpi of broad flat scales with slightly raised tuft of scales projecting forward between bases of antennae. **Thorax** – Patagia clothed with broad, yellow scales; tegulae and posterior part of thorax covered with blackish-gray scales with white on sides and tip and amount of dark shading more extensive on anterior and middle part of thorax than farther posteriorly. *Legs*: spiniform setae confined to tarsi and setae minute; foretibia slightly shorter (0.8 ×) than femur and tarsus. *Wings*: forewing venation typically quadrifine with cubital vein appearing four branched; forewing with obtusely angled tornus and acutely angled apex giving wing an elongated appearance; hindwing with typical trifine venation (i.e., $M_2$ reduced to fold near middle of cell), but veins $M_2$ and $CuA_1$ on common stalk (extending 0.10–0.25 × length of $M_3$). *Abdomen* – basal abdominal brushes and pockets absent. *Male genitalia* – *Uncus*: decurved, cylindrical, abruptly tapered to spine-like apex, with brush of long stout setae dorsally toward apex. *Tegumen*: broad, enlarged into posterior lobe ventrally, about 2 × as wide ventrally as mesially with tuft of long setae on ventral lobe; vinculum with short centrally angled saccus ventrally. *Juxta*: small, heavily sclerotized diamond-shaped plate with deep central notch posteriorly. *Valvae*: symmetrical, basally broad, narrowed mesially, broadening to broadly rounded apex, without corona; sacculus triangular, widest at base; apex of sacculus separated by narrow membranous band (typical of Elaphrini); clasper near dorsal margin of valva, arising from wider base immediately distal to sacculus, then narrow, curving and finger-like, about 1/4 × valva length; valva distal to sacculus lightly sclerotized except for band along costal margin. *Aedeagus*: smoothly sclerotized; everted vesica tubular, slightly longer than vesica with large subbasal diverticulum and large apical cornutus about 3/4 × as long as aedeagus. *Female genitalia* – corpus bursae gourd shaped, rounded posteriorly, abruptly tapered anteriorly into appendix-like tube; ductus bursae rugose with bands of sclerite, irregularly twisted to straight, heavily sclerotized posterior 1/3 of ductus bursae; apophyses long and narrow with triangular plate near middle of posterior apophysis; anal papillae broad, laterally flattened, setae sparse.

**Distribution and biology.** Known only from southwestern New Mexico and southeastern Arizona.

**Remarks.** This species would not normally be associated with the Noctuinae Elaphrini, except by the genitalia and DNA. It is confused with *Marimatha* species in all collections where we have found material. It can readily be distinguished from *Marimatha* by the narrow, acutely pointed forewing, the lack of a dark discal spot, the raised nodular sclerite of the metathoracic ear, and the characteristics of the genitalia given above.

***Pseudomarimatha flava* Ferris & Lafontaine, sp. n.**
urn:lsid:zoobank.org:act:8DABC755-7D63-44F4-8464-770CCE54375B
Figs 23–26

**Type material. Holotype** ♂. **New Mexico.** Grant Co., Spring Canyon, Mimbres Mts, 32°54.16'N 107°49.15'W, 7000' (2135 m), 22–24 June, 2009. C. D. Ferris. CNC. **Paratypes:** 33 ♂, 48 ♀. **USA. Arizona.** Cochise Co., Chiricahua Mts., Onion Saddle, 7700', 2 July 2005, B. Walsh, Ponderosa Pine/Oak habitat (1 ♀); Cochise Co., Chiricahua Mts., Cave Creek Canyon, 5400', 13–24 June 1966, J. G. Franclemont (1 ♂, 4 ♀); Cochise Co., Chiricahua Mts., East Turkey Creek, 25 June – 8 July 1966, J. G. Franclemont (6 ♀); Cochise Co., Chiricahua Mts., Onion Saddle, 7600', 7 July 1966 (1 ♀), 28 June 1967 (1 ♀), 29 July 1967 (1 ♀), J. G. Franclemont; Cochise Co., Chiricahua Mts., Pinery Canyon, 31°56.90'N 109°18.43'W, 5980' (1824 m), 31 July, 2007, C. D. Ferris (1 ♀); Cochise Co., Portal, 10 Aug. 1976, H. F. Howden. Genitalia CNC slide # 15035 m (1 ♂); Cochise Co., Southwest Research Station, 5400', 5 mi W Portal, C & M. Cazier (1 ♀); Santa Cruz Co., Harshaw Rd, Patagonia Mts, 31°28.201 N 110°42.45'W, 4820' (1537 m), 29 June, 2005, C. D. Ferris (4 ♂, 1 ♀); Santa Cruz Co., Harshaw Rd., Patagonia Mts., 31°27.701N 110°47.21'W, 5040' (1470 m), 29 June, 2005, C. D. Ferris (2 ♂); Santa Cruz Co., Madera Canyon, 5800', Santa Rita Mts., 1–13 July 1960, J. G. Franclemont (6 ♀). **New Mexico.** Grant Co., Spring Canyon, Mimbres Mts., 32°54.16'N 107°49.15'W, 7000' (2135 m), 22–24 June, 2009 (23 ♂, 22 ♀), 24 June 2008 (1 ♂, 3 ♀), C. D. Ferris; Grant Co., Cherry Creek Canyon, Pinos Altos Mts., 32°54.74'N 108°13.61'W, 6800' (2074 m), 25 June, 2008 (1 ♂). Paratypes deposited in CDF, CNC, CUIC, JBW, and USNM.

**Etymology.** The species name refers to the yellow color of the forewings and body.

**Diagnosis.** Recognized by elongate, acutely-angled, yellow forewing with no trace of maculation except for gray and blackish-gray shading on forewing margin and fringe. Male genitalia: recognized as member of Elaphrini by membranous suture dividing sacculus; other characteristics: tegumen broad, enlarged into posterior lobe ventrally; clasper near costal margin of valva; vesica with large apical cornutus 3/4 × as long as aedeagus. Female genitalia: corpus bursae gourd shaped, narrowing into anterior extension; anal papillae broad, flat, heavily sclerotized, sparsely setose.

**Description.** Genus monotypic, so structural characters given in generic description.

**Distribution and biology.** Known only from southeastern Arizona and southwestern New Mexico. Flight season late June to mid-August.

## Acknowledgments

We thank Terhune Dickel (Anthony, Florida), John Heppner (FSCA, Gainesville, Florida), Martin Honey (BMNH, London), Ed Knudson and Charles Bordelon (TLSC, Houston, Texas), James Liebherr and Richard Hoebeke (CUIC, Ithaca, New York), Daren Mann (OUMNH, Oxford), Wolfram Mey (ZMHB, Berlin), James Miller (AMNH, New York, NY), Michael Pogue (Systematic Entomology Laboratory, United States Department of Agriculture, USNM, Washington, DC), John Rawlins (CMNH, Pittsburgh, Pennsylvania), and Bruce Walsh (Tucson, Arizona) for the loan of specimens. We also thank Jocelyn Gill (CNC, Ottawa) for assistance with the preparation of the genitalia and photographs. Paul Hebert and the staff at the Canadian Centre for DNA Barcoding, Biodiversity Institute of Ontario, University of Guelph, Guelph, Canada, provided data and information from the Barcode of Life Data (BOLD) system. Bo Sullivan (Beaufort, North Carolina) generously shared data and specimens of *Marimatha* from Costa Rica from the study material for his revision of the genus in Central America and also reviewed the manuscript.

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